CLAIMS

1. A pneumatic tire comprising three or more circumferential main grooves asymmetrically positioned with respect to an equatorial line of the tire and extending linearly and continuously in the circumferential direction of the tread formed in a ground contact face of the tread to form one or more land part rows in each of the resulting central region and both side regions, in which

a sum of groove volume in a circumferential direction in lateral grooves formed in a shoulder land part row corresponding to an axially inner side of the tire mounted on a vehicle per unit width is made smaller than a sum of groove volume in the circumferential direction in lateral grooves formed in a shoulder land part row corresponding to an axially outer side of the tire mounted on the vehicle, and

the land part row in the central region is rendered into a rib, and

a plurality of slant grooves extending at an average inclination angle of not less than 45° with respect to a widthwise direction of the tread are arranged in a second inner land part row located at a side of the equatorial line adjacent to a shoulder land part row at the axially inner side and

these slant grooves are opened to the circumferential main groove at least located adjacent to the second inner land part row of the axially inner side.

2. A pneumatic tire according to claim 1, wherein the number of the circumferential main grooves is 4 or more, and

a plurality of lateral grooves opening at either one end to the circumferential main groove and terminating at the other end in the land part row are formed in a second outer land part row located adjacent to the side of the equatorial line of the tire in the shoulder land part row of the axially outer side.

3. A pneumatic tire according to claim 1 or 2, wherein the shoulder land part row of the axially inner side is divided into two parts by a fine groove extending in a circumferential direction, and an average angle of the lateral groove formed in the shoulder land part

row of the axially outer side with respect to the widthwise direction of the tread is not more than 15°.

4. A pneumatic tire according to any one of claims 1 to 3, wherein the shoulder land part row of the axially inner side is divided into two parts by a fine groove extending in a circumferential direction, and one divided portion located at a side of a tread end is a narrow-width rib and a plurality of small holes separated from the groove are formed in the other wide-width divided portion, which may be provided with lateral grooves.

5. A pneumatic tire according to claim 3 or 4, wherein a groove width of the fine groove is made wider in a side of a tread surface than in a groove bottom.

6. A pneumatic tire according to claim 4 or 5, wherein a total volume of plural small holes formed in the wide-width divided part at the shoulder land part row of the axially inner side in the circumferential direction of the tread is made larger at a side of the fine groove than at a side of the equatorial line of the tire.

7. A pneumatic tire according to any one of claims 4 to 6, wherein the wide-width divided portion having small holes a tread structure contacting with ground in at least a part of small hole forming region at a posture of applying a camber angle of -0.5° under an action of a load corresponding to 40% of a maximum load capacity.

8. A pneumatic tire according to any one of claims 4 to 7, wherein a side wall of the narrow-width rib located at a side of a tread end is a curved form having at least one center of curvature at an outer side of a cross sectional profile line.

9. A pneumatic tire according to any one of claims 1 to 8, wherein a center line of a rib of the central region land part row located nearest to the side of the equatorial line of the tire is biased to the axially inner side with respect to the equatorial line of the tire, and a plurality of widthwise fine grooves extending obliquely with respect to the widthwise direction of the tread are formed in this rib.

10. A pneumatic tire according to claim 9, wherein an inclination angle of the widthwise fine groove is an average angle within a range of 5-55°.

11. A pneumatic tire according to claim 9 or 10, wherein the widthwise fine groove is formed so as to incline in a depth direction in form of a curved face provided that it is separated away from each other bordering a middle part of its extending direction.

12. A pneumatic tire according to any one of claims 9 to 11, wherein at least a part of the widthwise fine grooves is terminated at both ends in the rib.

13. A pneumatic tire according to any one of claims 1 to 8, wherein a center line of a rib of the central region land part row located nearest to the side of the equatorial line of the tire is biased to the axially inner side with respect to the equatorial line of the tire, and a plurality of recesses having substantially an ellipsoidal form are formed in this rib, and a major axis of each of the recesses is extended at an angle of 5-45° with respect to the widthwise direction of the tread, and a side of the shoulder land part row in the rib at the axially inner side is defined by the circumferential main groove extending linearly.

14. A pneumatic tire according to claim 13, wherein at least a part of the recesses is provided with a sipe(s) extending in a direction of the major axis.

15. A pneumatic tire according to any one of claims 1 to 14, wherein the rib of the central region land part row located nearest to the equatorial line of the tire is defined by a pair of circumferential main grooves extending linearly, and a groove width of the circumferential main groove located at a side of the shoulder land part row of the axially inner side is made wider than a groove width of the circumferential main groove located at a side of the shoulder land part row of the axially outer side.

16. A pneumatic tire according to any one of claims 1 to 15, wherein a peripheral upheaved portion gradually decreasing a surface height toward at least one of a side edge of a block and a central

region of a block is formed in each of blocks defined by the lateral grooves in the shoulder land part row of the axially outer side.

17. A pneumatic tire according to any one of claims 1 to 16, wherein a height of a leading edge and a height of a trailing edge in a block defined by the slant grooves in at least a second inner land part row are made different in the widthwise direction of the tread, and each of high height portions is extended in the circumferential direction of the tread while changing positions in the widthwise direction of the tread in accordance with positions in the circumferential direction.

18. A pneumatic tire according to any one of claims 1 to 17, wherein a slant face gradually decreasing a height toward a top is formed in an acute corner portion of a block defined by at least one of the lateral groove and the slant groove extending at an average angle of not less than 45° with respect to the widthwise direction of the tread.

19. A pneumatic tire according to any one of claims 1 to 18, wherein a projection part projecting into a groove is disposed in a groove wall of the circumferential main groove opposite to a groove wall opening to at least one of the lateral groove and the slant groove at a groove opening position and a position opposite to the widthwise direction of the tread.

20. A pneumatic tire according to any one of claims 1 to 19, wherein a groove depth of the slant groove extending at an average angle of not less than 45° with respect to the widthwise direction of the tread is deepened from the side of the equatorial line of the tire toward the side of the tread end.

21. A pneumatic tire according to any one of claims 1 to 20, wherein extending directions of the slant grooves formed in the second inner land part row with respect to the widthwise direction are alternately rendered into opposite directions in the circumferential direction of the tread.

22. A pneumatic tire according to any one of claims 1 to 21, wherein an integral value of the rigidity in the widthwise direction of the tread over a full ground contact length in each of the land part rows defined by the circumferential main grooves is within a range of 50% from a large value between mutually adjacent land part rows.

23. A pneumatic tire according to any one of claims 1 to 22, wherein at a state that the tire is mounted onto an approved rim and inflated under a normal air pressure and loaded under a mass corresponding to the maximum load capacity, an effective ground contact area at either axially inner side or axially outer side is larger than that at the remaining other side, and a radial distance from a tangential line on the outer side surface of the tread perpendicular to the equatorial plane of the tire up to the ground contact edge of the tread at a posture of filling the normal air pressure is made larger at the mounting side having a small effective ground contact area than at the other mounting side.

24. A pneumatic tire according to claim 23, wherein a relation between a ratio of small and large effective ground contact areas (S-large/S-small) and a ratio of large and small radial distance (H-large/H-small) satisfies S-large/S-small = A x (H-large/H-small) wherein A is 1.0-1.4.

25. A tire-wheel assembly formed by assembling a pneumatic tire as claimed in any one of claims 1 to 24 onto a wheel, in which a connecting portion between a rim and a disc of the wheel is located toward an outer side of a vehicle to be mounted with respect to the equatorial plane of the tire.